

IN THE CLAIMS

1. (Currently Amended) A digital content downloading system using a network in which digital content, possessed by a digital content retailer communicatively coupled to the network, is downloaded to one of a plurality of consumers through a the network, comprising:

a plurality of subscriber lines each formed of an optical fiber and arranged between the consumers and the network, the network being managed by a network operator;

an optical line terminator, arranged on one side of the network, for terminating a subscriber line on the network side;

an optical network unit, arranged on a side of each consumer, for terminating a subscriber line on the consumer side;

a star coupler configured to connect the subscriber lines terminated by the optical network units to the subscriber line terminated by the optical line terminator;

a resource reservation server configured to reserve a particular bandwidth for the digital content in the subscriber lines in response to a request by a particular consumer; and

downward bandwidth managing means, arranged in the optical line terminator, for controlling downloading of the digital content from the digital content retailer to the optical network unit of the particular consumer so that the digital content is transmitted through the subscriber lines and the star coupler at the particular bandwidth reserved by the resource reservation server.

2. (Original) A digital content downloading system using a network according to claim 1, wherein the particular bandwidth for the digital content reserved in response to the request by the particular consumer by the resource reservation server is guaranteed in a shared bandwidth of the subscriber lines.

3. (Original) A digital content downloading system using a network according to claim 1, wherein the particular bandwidth for the digital content reserved by the resource reservation server in response to the request by the particular consumer is guaranteed in a first signal having a wavelength differing from that of a second signal corresponding to a shared bandwidth of the subscriber lines.

4. (Previously Presented) A digital content downloading system using a network according to claim 1, wherein the optical network unit arranged on the side of the particular consumer comprises:

an optical wavelength demultiplexing unit configured to demultiplex a multiplexed optical signal of a first wavelength transmitting through the subscriber lines;

a first optical receiving unit configured to receive a plurality of optical signals of the first wavelength demultiplexed by the optical wavelength demultiplexing unit and to convert the optical signals into a plurality of digital signals;

a passive optical network processing unit configured to extract data of the digital content from the digital signals obtained by the first optical receiving unit;

a plurality of interfaces, connected to a plurality of terminals in one-to-one correspondence, configured to respectively transmit data matching the corresponding terminal to the corresponding terminal; and

a destination judging and header processing unit configured to judge the destination of the data of the digital content extracted by the passive optical network processing unit to determine a particular terminal to which the data of the digital content is downloaded, to perform header processing for the data of the digital content to identify the content retailer,

and to transmit the data of the digital content to the particular terminal through one interface corresponding to the particular terminal.

5. (Previously Presented) A digital content downloading system using a network according to claim 1, wherein the optical network unit arranged on the side of the particular consumer comprises:

an optical wavelength demultiplexing unit configured to demultiplex a first multiplexed optical signal of a first wavelength transmitting through the subscriber line to a plurality of first optical signals of the first wavelength and to demultiplex a second multiplexed optical signal of a second wavelength transmitting through the subscriber line to a plurality of second optical signals of the second wavelength, the second multiplexed optical signal including data of the digital content of which the particular bandwidth is reserved by the resource reservation server;

a first optical receiving unit configured to receive the first optical signals of the first wavelength from the optical wavelength demultiplexing unit and to convert the first optical signals into a plurality of first digital signals;

a second optical receiving unit configured to receive the second optical signals of the second wavelength from the optical wavelength demultiplexing unit and to convert the second optical signals into a plurality of second digital signals;

a passive optical network processing unit configured to extract the data of the digital content from the second digital signals obtained by the second optical receiving unit;

a plurality of interfaces, connected to a plurality of terminals in one-to-one correspondence, configured to respectively transmit data matching the corresponding terminal to the corresponding terminal; and

a destination judging and header processing unit configured to judge the destination of the data of the digital content extracted by the passive optical network processing unit to determine a particular terminal to which the data of the digital content is downloaded, to perform a header processing for the data of the digital content to identify the content retailer, and to transmit the data of the digital content to the particular terminal through one interface corresponding to the particular terminal.

6. (Previously Presented) A digital content downloading system using a network according to claim 1, wherein the content retailer is configured to charge the particular consumer for the downloading of the digital content according to the particular bandwidth reserved by the resource reservation server, a time period used for the downloading, or a time zone used for the downloading.

7. (Previously Presented) A digital content downloading system using a network according to claim 6, wherein information of charges corresponding to a bandwidth used for the downloading of data including the digital content, a time period used for the downloading of data including the digital content, or a time zone used for the downloading of data including the digital content is transmitted from the network operator to the consumers.

8. (Previously Presented) A digital content downloading system using a network according to claim 1, wherein the digital content is a music file, a video file, or a game software title.

9. (Currently Amended) A digital content downloading system using a network in which digital content, possessed by one of a plurality of content retailers communicatively coupled to the network, is downloaded to a consumer through a the network, comprising:

a plurality of subscriber lines each formed of an optical fiber and arranged between the content retailers and the network, the network being managed by a network operator;

an optical line terminator, arranged on a side of the network, for terminating a subscriber line on the network side;

an optical network unit, arranged on a side of each content retailer, for terminating a subscriber line on the content retailer side;

a star coupler configured to connect the subscriber lines terminated by the optical network units to the subscriber line terminated by the optical line terminator;

a resource reservation server configured to reserve a particular bandwidth for the digital content in the subscriber lines for the downloading of the digital content to the consumer as a bandwidth reservation in response to a request by a particular content retailer;

upward bandwidth managing means, arranged in the optical line terminator, for receiving the bandwidth reservation from the resource reservation server; and

upward transmission control means, arranged in the optical network unit of a particular content retailer, for controlling downloading of the digital content from the optical network unit of the particular content retailer to the consumer so that the digital content is transmitted through the subscriber lines and the star coupler at the particular bandwidth according to the bandwidth reservation received from the upward bandwidth managing means.

10. (Original) A digital content downloading system using a network according to claim 9, wherein the particular bandwidth for the digital content reserved in response to the

request by the particular content retailer by the resource reservation server is guaranteed in a shared bandwidth of the subscriber lines.

11. (Original) A digital content downloading system using a network according to claim 9, wherein the particular bandwidth for the digital content reserved by the resource reservation server in response to the request by the particular content retailer is guaranteed in a first signal having a wavelength differing from that of a second signal corresponding to a shared bandwidth of the subscriber lines.

12. (Previously Presented) A digital content downloading system using a network according to claim 9, wherein the optical network unit arranged on the side of the particular content retailer, comprises:

an interface configured to receive data of the digital content from an external terminal;

a quality-of-service control unit configured to control the transmission of the data of the digital content received in the interface according to the bandwidth reservation received by the upward transmission control means;

a passive optical network processing unit configured to control a transmission timing of the data of the digital content, of which the transmission is controlled in the quality-of-service control unit, to prevent the interference of the data of the digital content with data transmitted from the other optical network units;

a first optical transmitting unit configured to convert the data of the digital content, of which the transmission timing is controlled in the passive optical network processing unit, into a plurality of optical signals having a first wavelength and transmitting the optical signals; and

an optical wavelength multiplexing unit configured to multiplex the optical signals transmitted from the first optical transmitting unit to a multiplexed optical signal and to output the multiplexed optical signal to the corresponding subscriber line.

13. (Previously Presented) A digital content downloading system using a network according to claim 9, wherein the optical network unit arranged on the side of the particular content retailer, comprises:

an interface configured to receive first data and second data of the digital content from an external terminal;

a quality-of-service control unit configured to control the transmission of the first data and controlling the transmission of the second data of the digital content received in the interface according to the bandwidth reservation received by the upward transmission control means;

a passive optical network processing unit configured to control transmission timings of the first data and the second data of the digital content, of which the transmission is controlled in the quality-of-service control unit, to prevent the interference of the first data and the second data of the digital content with data transmitted from the other optical network units;

a first optical transmitting unit configured to convert the first data, of which the transmission timing is controlled in the passive optical network processing unit, into a plurality of first optical signals having a first wavelength and transmitting the first optical signals;

a second optical transmitting unit configured to convert the data of the digital content, of which the transmission timing is controlled in the passive optical network processing unit,

into a plurality of second optical signals having a second wavelength, differing from the first wavelength and to transmit the second optical signals; and

an optical wavelength multiplexing unit configured to multiplex the first optical signals transmitted from the first optical transmitting unit to a first multiplexed optical signal, to multiplex the second optical signals transmitted from the second optical transmitting unit to a second multiplexed optical signal, and to output the first multiplexed optical signal and the second multiplexed optical signal to the corresponding subscriber line.

14. (Previously Presented) A digital content downloading system using a network according to claim 9, wherein the network operator charges the particular content retailer for the downloading of the digital content according to the particular bandwidth reserved by the resource reservation server, a time period used for the downloading, or a time zone used for the downloading.

15. (Previously Presented) A digital content downloading system using a network according to claim 14, wherein information of charges corresponding to a bandwidth used for the downloading of data including the digital content, a time period used for the downloading of data including the digital content, or a time zone used for the downloading of data including the digital content is transmitted from the network operator to the content retailers.

16. (Previously Presented) A digital content downloading system using a network according to claim 9, wherein the digital content is a music file, a video file, or a game software title.



17. (Previously Presented) The digital downloading system of claim 1, wherein the resource reservation server is arranged in the network separate from the optical line terminator and the optical network units.

18. (Previously Presented) The digital downloading system of claim 1, wherein the resource reservation server is configured to reserve the particular bandwidth so that the particular bandwidth is reserved from a particular start time to a particular end time.